The Citrus Industry

FLORIDA'S EXCLUSIVE CITRUS MAGAZINE...

Featured In This Issue

Some Problems of Control Of Scale Insects On Citrus

How The Food for Freedom Program Is Shaping Up

The Fertilizer Situation

The Florida Citrus Season to Date

Rust Mite Control

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JACKSONVILLE, FLORIDA

JUNE, 1942

Vol. 23 — No. 6

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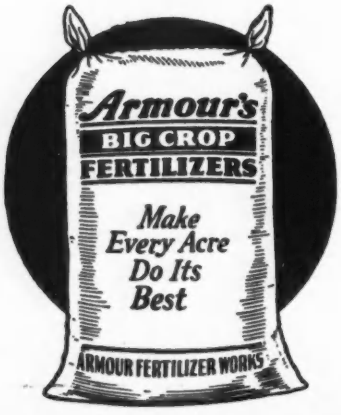

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Rust Mite Control . . .

By J. R. WATSON, Entomologist
Florida Experiment Station

In many sections of the citrus belt rust mites are beginning to appear on the young fruit and it will be necessary from now on until sometime in July to watch our fruit very carefully. After the rainy season becomes well established in July a fungus disease will usually control rust mites fairy well, but the warm weather of April, May and June, together with the relative dryness as compared with the summer months, makes a dangerous period.

The work of Mr. Thompson of our Lake Alfred Station has shown that rust mites attack the young fruit earlier than we had previously supposed and this early type of rust mite injury has a different appearance than that characteristic of their work on somewhat larger fruit. Instead of an even, smooth discoloration the rind shows a mottling effect as the thin epidermis breaks up into small, rough crescent-shaped areas.

Warm dry weather is very favorable for the development of rust mites and they multiply very rapidly. Each female lays on the average of about 500 eggs and she may mature in as short a time as seven days; i. e., she may begin to lay eggs when she is a week old, although usually it is 10 to 12 days. It is this rapid breeding which enables rust mites to appear in large numbers so quickly when weather conditions are favorable. Rust mites appear first on leaves and twigs, and only when the young fruit begins to approach an inch in diameter do they migrate to it. As to just how much injury they may do to the leaves and twigs, we have no very definite information, but the injury to the fruit and to the pocketbook of the grower is only too well known.

The economical way to fight rust mites is to provide one's self with a good magnifying glass, one magnifying about ten times, and inspect the fruit frequently, particularly during warm dry weather such as we are liable to have for some weeks. Of course, one cannot examine every fruit in the grove but on the other hand do not go into your grove, look at a few of the trees near the gate and then get in your car and drive off with the feeling that you have given it an adequate inspection. Rust mites may be scarce in one part of the grove and very abundant in another. Therefore, visit all parts of the grove. Rust mites usually appear, particularly on a small tree, first on the southeast corner of the tree where the morning sun hits them. On a fruit fully exposed out in the bright sun, look on the shady side for rust mites; i. e., on the side of the fruit towards the tree. On the other hand, on fruit which is shaded by leaves, look on the side of the fruit facing outward from the tree. Rust mites want a good supply of light but usually avoid the direct rays of the mid-day sun. Those fruits back in the interior of the tree where they are thoroughly shaded from the sun are usually comparatively free from rust mites. With this knowledge of where to find rust mites, go through the grove and if you find that half of the "fields" you examine are infested, it is time to apply remedies. By a "field" we mean that part of the fruit which you can see

(Continued on page 12)

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The Florida Citrus Season To Date

C. V. NOBLE
Agricultural Economist
Florida Experiment Station

The 1941-42 Florida citrus crop will perhaps return a higher net income to growers than any other recent season's crop. The estimated volume of the current season's crop is but 9 percent below the total production for the 1940-41 season. At the end of the third week in April, over three-fourths of the estimated orange and grapefruit crops had been marketed and the tangerine season was practically closed. A comparison of the average price received per box on the ten citrus auction markets to date this season with the corresponding prices last season indicates that there has been an increase of 15, 25 and 51 percent, for oranges, grapefruit, and tangerines, respectively, this season. Auction prices are fair indicators of sales made through other channels. It is believed that these increased prices will more than offset the increased costs of labor and materials used in the production, harvesting and marketing of the current crop.

There are many reasons for this outlook for one of the most satisfactory citrus seasons in recent years. Some of these reasons are beyond the control of the Florida citrus industry; others are direct results of combined industry effort in cooperation with the Federal and State governments. A few of the outstanding reasons will be mentioned.

1. Income of industrial workers increased from 39 percent above the 1935-39 average in February, 1941, to 92 percent above in February, 1942, due to the defense and the total war production program. Incomes of other groups of workers did not increase at so rapid a rate during this period, but the total increase in consumer purchasing power was perhaps the principal reason for higher citrus prices.

2. Cooperation of the citrus industry with the Federal and State governments in several programs most certainly is producing salutary effects, thought they do not lend themselves readily to statistical measurement. Some of these programs will be mentioned briefly.

Size and grade regulations have been in effect throughout the season under the Citrus Marketing Agreement with the Federal government. Although these regulations have been made effective with previous crops, it is reasonable to believe that their efficiency will improve with experience in their use. Perhaps the best indicator of the value of these regulations is to compare the Florida situation with that of California. Early last December California abandoned all regulations under their orange marketing agreement. Since that date, California oranges have averaged lower in price on the ten auction markets than during the same period in 1940-41 when regulations were in effect. During this same period, Florida orange prices were appreciably higher this season than last season. In fact, the California orange price premium above Florida oranges has been narrower to date this season than for

(Continued on page 13)

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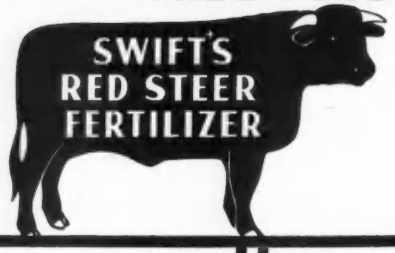

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Issued Monthly
Representative of every interest
Representing no special interest

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How The Food For Freedom Program Is Shaping Up

J. FRANCIS COOPER
Extension Editor
Florida College of Agriculture

In response to pleas from the Secretary of Agriculture and other leaders, Florida farm families have embarked on a food for freedom program in 1942 which calls for more peanuts and some other products than ever have been harvested from this state's farms before. Our patriotic people are determined to do their utmost to grow those things needed by themselves, American fighting forces, and our allies.

So at this time, when spring planting is finished, it may be well to make a brief checkup and see just where we stand. Despite bad weather and a shortage of labor, it now seems quite likely that Florida farm families will reach or even exceed most of the goals set for them by the Secretary of Agriculture. H. G. Clayton, chairman of the Florida USDA War Board, told me recently that reports to him from all counties indicate that Florida farmers will deliver the goods.

Florida's goal of 273,000 acres of peanuts has been the one giving most concern, since peanut oil will be urgently needed and since tripling the state's peanut acreage at one jump is a big task. But Mr. Clayton says that good progress is being made towards reaching the peanut goal. Florida farmers have purchased thousands of bushels of peanut seed and are now waiting only for the ground to dry out before they start planting the lowly peanut on a scale unprecedented in this state. When the final tally is made it may be found that Florida farmers have fallen short of their peanut goal, but it will certainy be true that they have made tremendous increases in their plantings as a result of the food for freedom call.

Another call is for 20,000 acres of Sea Island cotton producing a staple of 1½ inches in length. Here again there will likely be difficulty, because Sea Island cotton has not been profitable recently, and because farmers have already arranged to expand their peanut acreage and will not be able to expand in both peanuts and Sea Island cotton. But I am sure that every farmer who can do so will grow some Sea Island cotton to help make parachutes and other fabrics and ropes used by our Army and Navy. The Community Credit Corporation is offering to buy all Sea Island produced, at prices ranging from 42 to 49 cents a pound for No. 1 grade of different lengths.

Increases already have materialized in poultry and egg production—in fact, the supply of eggs and chickens has been so large that prices have been unsatisfactory to producers. The Department of Agriculture has inaugurated a purchase program for eggs assembled at designated markets to help relieve the situation. Twice as many dried eggs are going abroad now in one month as were formerly shipped in a year.

It seems quite likely that the revised Florida goal for hogs will be exceeded, and that cattlemen will move the desired amount of beef to market. Florida cows are giving more than enough milk to supply current needs, except possibly in farm homes. With fewer tourists and consequently lower consumption of milk in the cities, commercial dairymen are beginning to dispose of some of their cows. This offers farm families not having enough milk cows an excellent opportunity to secure some good cows at reasonable prices.

In so far as possible turpentine farmers are stepping up their production of vitally needed naval stores. Here again the labor shortage has caused lower production than would have been obtained otherwise.

When it comes to home gardens the showing is not as good as Department of Agriculture officials had hoped. They requested a good home garden available to every farm family. While there has been a considerable increase in Florida home gardens, the number is still considerably short of the goal of 61,500.

In general, then, it seems that the number of home gardens is short, the acreage of peanuts may fall somewhat short of the goal, the acreage of Sea Island cotton likely will be less than requested, and naval stores production may be slightly below the goal of 107,400 units. But

(Continued on page 13)

Some Problems of Control of Scale Insects On Citrus...

As Presented Before Florida State Horticultural Society at West Palm Beach

By W. L. THOMPSON
Associate Entomologist, Citrus Experiment Station
Lake Alfred, Florida

In Florida citrus circles one of the most discussed topics of the day, aside from licking the Japs and Germans, is the control of purple (**Lepidosaphes beckii** (Newm.)) and Florida red scales (**Chrysomphalus aonidum** (Linn.)). In recent years the problem of control has been increasingly difficult, especially in groves on the sandy soil of the central part and west coast of the state. The control of scales, particularly red scales, has always been more of a problem in groves grown on the heavier soils of the east coast and west coasts where the trees never became so deficient in some of the nutritional elements and therefore were more vigorous than trees grown on the sandier soils. The only explanation your speaker has to offer for the general increase of infestations in the sandy soils is the revolutionary changes in citrus nutrition which has resulted in the growth of much more vigorous trees than were grown in the late twenties and early thirties when scale control was not so much of a problem. Aside from the change in the nutritional program the cultural practices are much the same as they were ten or more years ago. Likewise, the seasons have been no different than previous seasons throughout the past twenty years, that is, some have been dry, some wet and some normal or average, yet the scales have been thriving both in wet seasons as well as in dry ones. During the past year there was no extended dry period during the summer, fall and winter and scale fungi were abundant, yet there is a marked carry-over of purple and red scales this spring. In previous papers read before this and other groups your speaker has stated that the apparent reason for the increase of scale insects has been the increased vigor of the tree resulting from the cultural program now practiced by the average producer of citrus. Some of the indirect factors influencing scale build-up which are results of tree vigor are increased shade, longer life of leaves which in turn means less elimination of scale colonies from premature dropping of leaves, and the failure to obtain a thorough coverage with the oil sprays on densely foliated trees.

To illustrate briefly the correlation of the degree of scale infestations to tree condition, a four-year record of purple scale populations from two plots of seedy grapefruit trees in a fertilizer experiment at the Citrus Experiment Station is presented as a resume of this topic which has been discussed in previous publications. The data from this particular experiment are presented because there have been no copper, zinc or manganese sprays applied to these trees which eliminates the factors of fungicidal or residual sprays influencing the scale populations. The fertilizer experiment was started in January, 1937, and since 1938 scale population records have been taken each fall from leaves collected from the outside of the tree canopy as well as from leaves collected from within the canopy. In one plot the trees have been in healthy, vigorous, growing condition for four years and in the other plot the trees have been hard, sparsely foliated, and in a weakened condition. The fertilizer and spray treatments have been identical in both plots except that in Plot 1, which contains the vigorous trees, magnesium has been added to the fertilizer formula and in Plot 5 no magnesium has been used.

In January, 1937, when the experiment was started all of the trees were in the same general condition but by the fall of 1938 and each succeeding year the trees in Plot 1 were in a much more vigorous condition than the ones in Plot 5. In Plot 1 the scale population has been, on a four-year average, 24 percent higher on outside leaves and 180 percent higher on inside leaves than on leaves in the same respective positions on trees in Plot 5. The difference in ratio of scale population on outside leaves to inside leaves in the two plots is also significant. In Plot 1 the average ratio of scales on outside leaves to inside leaves for the four-year period is 1.0 to 6.5 and in Plot 5 is 1.0 to 4.4. The average ratio in Plot 5 increased almost 300 percent this year because there was no crop on these trees and the percentage of green leaves was much higher than usual which resulted in a heavier scale infestation. In 1939, another light crop year, there was a wider ratio of scale population on outside leaves to inside leaves than there was during the other two years when there was a crop which resulted in a higher percentage of bronzed leaves due to magnesium deficiency (Table 1). In Plot 1, one of the most important factors influencing the wide ratio of scale population on outside leaves to the population on inside leaves is the fact that those trees have had a fairly dense to dense canopy of foliage throughout each year while in Plot 5 where there is not such a wide ratio on the average year, the trees are more open and sparse of foliage in two out of four years. Since 1938 they have never been as well foliated in any one year as the trees in Plot 1. Aside from the fact that the trees in Plot 1 have a constantly higher percentage of green leaves, the continuous shaded condition is much more favorable for scale development than the open type trees in Plot 5.

A review of the data illustrating the direct correlation of scale population to tree vigor has been given because the continued vigor of the trees throughout the year is probably the main factor responsible for the more rapid reinfestation of groves rather than any lessening in effectiveness of the standard oil sprays now in use as well as some of the tankmix oils used by some producers. There has been no trouble with heavy reinfestations in Plot 5 in the experiment discussed above but in Plot 1, where the trees are in a more vigorous condition, scale control has been a problem. In 1938 all plots were sprayed in June and again in October with an oil emulsion but no oil sprays were appplied during 1939 or 1940. Between the fall of 1939 and the fall of 1940 the scale population in Plot 1 had increased 790 percent

on outside leaves and 660 percent on inside leaves but in Plot 5 there was only an increase of 200 percent on outside leaves and 54 percent on inside leaves.

For the past five years repeated experiments have been conducted with oil sprays for scale control and the average reduction of the scale population four to five weeks after the spray, has been over 90 percent and ranging from 85 percent to 99 percent. The percentage of reduction has been no lower following oil sprays the past five years than during the five previous years but reinfestations have occurred much sooner than in former years. An example is sighted from another experiment to show the rapid reinfestation of purple scales on vigorously growing Pineapple orange trees as compared to a decrease of infestation on hard, sparsely foliated ones. In 1940 an experiment was conducted to determine whether there was any significant difference between the control of purple scale where an oil emulsion was used at 1.25 percent actual oil compared to 1.5 percent actual oil. The oil used was a 70 viscosity oil and each concentration was applied on duplicate plots; a prespray count of scales was made and four weeks after the application the postspray count was made. The trees used for the experiment were large Pineapple trees with dense foliage. These trees had been used in a zinc experiment the three previous years but there was no zinc application made during 1940. The trees in the plot used for a check had never received any zinc and they were thin of foliage and not so vigorous as those sprayed with zinc the three previous years. Four weeks after the spray the scale population in the two plots receiving 1.25 percent oil had been reduced 97 and 98 percent, respectively, and in the plots receiving 1.5 percent oil the population had been reduced 94 percent and 99 percent. The infestation in the unsprayed check had increased 59 percent. A second count was made in February, 1941, or approximately six months after the post-spray count and the scale population had increased in the sprayed plots on an average of 900 percent while in the check plot where the trees were less vigorous the infestation had decreased 52 percent. During 1941 in the experimental plots where there were vigorously growing trees the scale infestations have increased following the oil spray in about the same proportion as they did in 1940 but on trees in a more or less weakened condition there has been very slight increases since the oil sprays or since the scale counts were made last fall. The results obtained from these and other experiments indicate that even though a substantial reduction of a scale infestation may be obtained, an annual oil application is necessary to keep the infestation at a low level, especially in groves that are kept in a healthy, growing condition.

Since an annual oil spray seems advisable it is necessary to time the application so that it will be more beneficial for controlling scales and least likely to shock or injure the trees. There are a number of factors to be considered in connection with the timing of the oil spray and a few of them will be considered in the following discussion.

TABLE 1

Ratio of Purple Scale Populations on Outside Leaves to Inside Leaves.

	Year	Ratio of Scale Populations out side to Inside	Amount of Bronzing		Crop
			Outside	Inside	
Plot 1	1938	1:5.0	Light	Light	Heavy
	1939	1:7.9	Very Light	Very Light	Light
	1940	1:6.8	Light	Light	Heavy
	1941	1:7.7	Very Light	Very Light	Light
Plot 5	1938	1: .8	Heavy	Heavy	Heavy
	1939	1:2.7	Heavy	Medium	Light
	1940	1:1.4	Heavy	Heavy	Heavy
	1941	1:14.8	Medium	Light	Light

Timing Oil Sprays for Florida Red And Purple Scale Control

It is commonly known to most growers that scale insects are most easily killed in the younger stages of development but in a warm climate, such as in Florida, there is an over-lapping of the different stages and the peak of any one stage as a group is not so sharp. Florida red scales are more difficult to kill than purple scales. The young and intermediate stages as well as a high percentage of the adult females can be killed with an oil emulsion at 1½ percent to 1⅞ percent actual oil, but the armor of the scale is fastened so tightly to the leaf that the oil

(Continued on page 14)

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ENTITLED TO RELIEF

With government officials calling for increased production of foodstuffs and army officers stressing the importance of fruit in the diet of men in the armed forces, it occurs to us that there should be some revision of the order requiring that trucks delivering fertilizers must return with a pay load of other freight.

If vegetables, fruit and farm crops are to be produced in increasing quantities, fertilizers must be applied. If fertilizers are to be available to producers, there must be free movement of raw materials to the factories and free movement of the finished product from the factories to the groves and fields.

Evidently, it is impossible for fertilizer manufacturers to deliver their product to the producer or to central distribution points if their trucks must return to the factory with a pay load of other goods. Strict application of this rule would work a hardship; first, upon the grower whose production would be curtailed; second, upon the fertilizer manufacturer who could not deliver his goods, and finally, upon the consuming public whose supply of fruits and vegetables would be reduced — and this at a time when the government is calling for increased production and advising increased consumption.

We believe that the Office of Defense Transportation should be advised of this situation and that the rule as it applies to the transportation of fertilizers, fruits and other perishables should be suspended.

FLORIDA ORANGES TOP MARKET

It is gratifying to growers of Florida oranges to know that their product continues to outsell the California product on the auction markets, as it has been doing for the past several weeks.

While Florida fruit, now nearing the close of the current shipping season, is reaching the consuming centers in prime condition, there have been some complaints that California navels have not been in the best of condition.

For the period ending on Friday, May 22, Florida oranges were commanding an average premium of 25 to 35 cents per box over the California fruit, while some of the choicest offerings were bringing an even greater margin of spread over California offerings.

Shipments of oranges from Florida have been falling off steadily for the past several weeks, while shipments from California have increased to a point more than making up the smaller shipments from Florida.

Grapefruit shipments also have been on the decline with the result that prices have been higher.

FLORIDA CITRUS SEASON NEARS END

Reports from the Florida Citrus Inspection Bureau at Winter Haven indicate that the close of the present citrus shipping season is near at hand.

During the first week in May movements amounted to 1,081,536 boxes, or 2704 cars; for the second week of the month the volume was 975,191 boxes, or 2439 cars; while for the week ending May 15, the total shipments aggregated 822,008 boxes, or 2055 cars. For the week ending May 22, the shipments amounted to 812,248 boxes, or 2030 cars. During that week only nine boxes of tangerines were shipped, coming from the Fort Pierce district and being the first of this variety since May 7.

For the week ending May 22, the shipments included 187,733 boxes of grapefruit, and 624,506 boxes of oranges, compared with 216,075 boxes of grapefruit and 605-933 boxes of oranges the previous week.

CITRUS EXPERTS VISIT WASHINGTON

To confer with research, sales and promotional departments of the Florida Citrus Commission in New York, Dr. L. G. MacDowell, the commission's research director and Marvin H. Walker, Secretary-Manager of the commission, are at this time in New York to further the interests of the commission and Florida citrus growers.

After the conferences in New York, they will stop in Washington to confer with W. J. Steed, the commission's Washington representative about governmental matters affecting the industry in Florida. Dr. MacDowell will also go to College Park, Md., in connection with a research project there.

Some matters of vital importance to the industry are expected to be adjusted as a result of these conferences.

The citrus grower's first aim should be the production of quality fruit in sufficient abundance. To do this he must have sufficient fertilizers and sufficient insecticides to assure quality fruit. Anything which stands in the way of his securing these materials is detrimental not alone to the grower, but also to the consuming public.

Any scrap iron, scrap rubber or other scrap now rusting or rotting in the fence corners is valuable to Uncle Sam in his war effort. Growers can do their part toward hastening victory for the United Nations by turning in this scrap.

Some sections of the "belt" have been favored with fairly generous showers, but more are needed.

The Fertilizer Situation

By F. J. WOODS, Chairman Sub-Committee on Fertilizer Ingredients and Nitrates, Division of Agriculture, State Defense Council, at Meeting of Florida State Horticultural Society

The involvement of this country in the war has presented many new problems to every industry. The growers and farmers of the country are affected from several different angles, and I will try to present some of the effects on fertilizer supplies so vital to the production of satisfactory crops. I will necessarily limit my remarks to the effect on the Florida supplies.

From the standpoint of volume, the most important fertilizer ingredient is Phosphoric Acid, the majority of which is supplied in the form of Superphosphate used in mixed fertilizer. Superphosphate is the resulting product when Ground Phosphate Rock is treated with Sulphuric Acid. There are some six or seven manufacturers of Sulphuric Acid in Florida and were their productions utilized only for the supply of Superphosphate needed by Florida growers and farmers, there would be the greatest plenty of Phosphoric Acid for every grower in the state. But in the manufacture of certain types of powder needed for our armed forces, it is necessary to dehydrate the powder with Sulphuric Acid and the manufacturers of this Acid are supplying some of their production for this purpose. The available supply of Phosphoric Acid for the duration of the war will be entirely dependent upon the call of the munition industry for Sulphuric Acid produced in Florida.

Next important from the standpoint of volume used is Nitrogen. First in importance is Ammoniacal Nitrogen. It is obtained primarily from Sulphate of Ammonia and Nitrogen Solutions. The largest source of Sulphate of Ammonia is the by-product production from the manufacture of steel. Upon this statement, knowing that the steel production of the country has been greatly increased, one would be led to believe that there would be a greatly increased production of this material. Such is not the case for many forms of steel used in the war effort are not manufactured by a process producing Sulphate of Ammonia. Actually the production of Sulphate of Ammonia is only a very small percentage greater at this time than it was a year or two ago. The production of this material has been hampered by strikes in the steel plants and the producers of it have been delayed up to date as much as six weeks and longer in making deliveries. The present indication is that they will complete their current seasonal contracts with fertilizer manufacturers, but it may be August before these deliveries are completed and, of course, the need for the material is now — during the summer application of fertilizer for citrus.

Nitrogen Solution has become an increasingly important material. It is received in liquid form in tank cars under pressure as it is a condensed gas. It is then introduced into a mixer with Superphosphate and the Nitrogen and Phosphoric Acid combine in producing Ammoniated Superphosphate. These Nitrogen Solutions are produced synthetically and there are several new plants now in the building for the production of this material. Liquid Nitrogen is a vital war material. It is used in the production of Nitric Acid for the manufacture of T. N. T. and other explosives. The industry has recently been advised that there is serious doubt that the contracts for the current season will be completed because of the heavy demand for the material for the production of explosives.

Nitrate Nitrogen is important in the production of almost all Florida crops. This form of Nitrogen is secured from Nitrate of Soda, Nitrogen Solutions and Nitrate of Potash. Of course, there are some foreign materials, such as Cal-Nitro and German Nitrate of Potash which have furnished this form of Nitrogen in times of peace, but these materials have not been available for import for some three years. Nitrate of Soda, like Nitrogen Solution, can be used for the production of Nitric Acid used in the manufacture of explosives. The use of Nitrate of Soda for this purpose is an obsolete, expensive procedure but it may have to be used before we win this war. With this in mind, the War Production Board is establishing a stock pile of some 150,000 tons of Nitrate of Soda. The establishing of this stock pile and the scarcity of ships with which to move the Chilean material from that country, as well as the diverting of Nitrogen Solutions to war production, have seriously curtailed the supply of Nitrate Nitrogen for agricultural use. Last December the War Production Board took over all supplies of Nitrate of Soda in the hands of the original sellers and this material has been allocated to the fertilizer manufacturers each month since that time. The supplies allocated have not been sufficient to meet the demand, particularly since the demand for this material was greatly increased by the shortage of Ammonical Nitrogen.

Organic Nitrogen is of major importance in the production of our crops. It is supplied in many forms of animal and vegetable matter. Many of the organic materials normally used in fertilizer are likewise suitable for the feeding of animals and poultry. The increased demand upon the meat, milk and poultry producers has made serious inroads on the available supply of organics for fertilizer. These inroads have greatly increased the cost of these materials but if a manufacturer has been able to pay the price, I believe he has been able to secure these organic matrials.

Next in importance on a volume basis is Potash, and the growers and farmers of the whole country cannot give too much praise to the American Potash industry. It has done a marvelous job of supplying the agricultural as well as the industrial requirements of this country. In the last war, many of you will remember that the supply of Potash, at that time originating in Germany and France, was almost entirely cut off, and agriculture seriously suffered from the lack of this important element. Indications are that deliveries to fertilizer manufacturers of Potash will be made in accordance with the contracts for the balance of this season. In attempting to look into the future, the only serious problem that should affect the supply of Potash will be transportation for all of this material is mined in the far West.

Those mineral elements, for convenience designated as "Secondaries," have been in reasonably good supply. The Committee on Insectici-

(Continued on page 12)

General Washington and General Miraculous Military Feats Against

We Cannot Supply All Demands

For Superior's Extra Value Fertilizers, But We're Proud The Demand Continues . . . —

Owing to the unprecedented demand for our fertilizers we are not able now to care for many of the new orders which come to us . . . —

But we are happy to be in position to care for the demands of all of our regular customers, who have learned from experience that our Extra Value Brands do a job of crop production that can always be depended upon . . . —

We shall continue to use every means at our command to care for our regular customers, and look forward with pleasure to the day when we may be able to serve all Florida growers who now desire to build fine crops through the use of our Extra Value fertilizers . . . —

You Get All Ten Vital Elements in Superior's Extra Value Brands

But Neither of These National Heroes Grow Out[stan]d Crops [in] Flor[ida] Without the A[id] of Fertili[zers] [Rich] In Plant De-veloping Foods

Superior Fertili[zers]

Phone Y-1623

G. D. Sloan,

Factory and Office East Broadway At[lantic]

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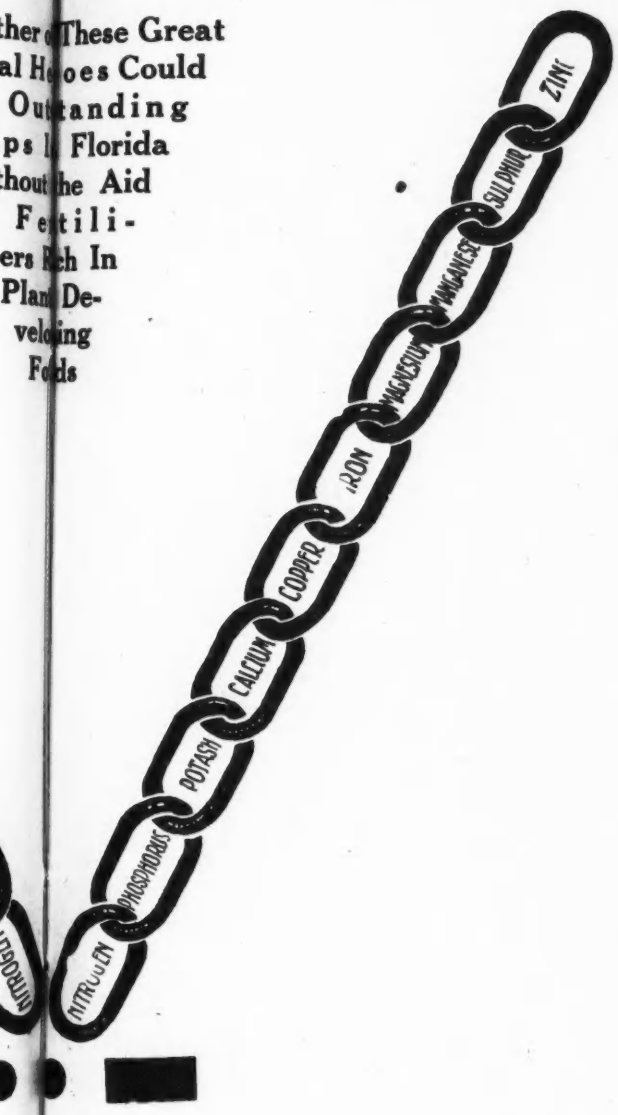

Superior's Extra Value Insecticides

Are playing an increasingly valuable part in keeping trees and crops free of the devastating pests which are dangerous to Florida crops . . . —

Extra Value Neu-Cop 50% Copper — Far better than most neutral coppers . . . —

Extra Value Wettable Sulphur, 97% Sulphur . . . —

Zinc-Co Wettable Sulphur, 80% Sulphur, 1.75% Zinc, 3.75% Copper . . . —

Z-S Wettable Sulphur, 93% Sulphur, 1.75% Zinc . . . —

Extra-Value Spray Oil. A better oil emulsion containing 83% Oil . . . —

Superior's 99-1 Oil. A better tank mix oil. Contains 99% Oil . . . —

Each does its job with maximum efficiency and with greatest economy . . . —

Protect Trees and Crops With Extra Value Insecticides

tilizer Company

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way At 47th Street, Tampa, Florida

THE FERTILIZER SITUATION

(Continued from page 9)

des, cooperating with our committee, anticipated a shortage of these "Secondaries" and Dr. Camp, head of the Citrus Experiment Station at Lake Alfred, with the cooperation of other officials, prepared a valuable brief on the vital need of these "Secondaries" in the production of Florida crops. This brief was forwarded to many officials in Washington and, no doubt, played a valuable part in making available the supplies for fertilizer and insecticide manufacturers this season.

There have been necessary changes in mixtures manufactured and offered for sale and there will probably be more changes occasioned by the shortage of certain materials. I personally take the view that this war is our war and if our crops must do without something which is needed for munitions, we must accept that shortage with as good grace as possible. We must be constantly on the alert, however, to prevent materials being diverted solely because of the lack of information by Washington or other authorities.

The heaviest fertilizer consuming area is, of course, the field crop area, namely North Carolina, South Carolina and Georgia. North Carolina uses almost twice as much fertilizer as Florida and South Carolina and Georgia each use more fertilizer than we do here. Consequently, there is a tendency on the part of controlling officials to base their decisions on the requirements of cotton, corn and tobacco. These conditions are totally different from those existing in Florida and I am sorry to state that, in spite of many efforts to present the Florida picture, I do not believe that the Washington control officials have much idea of our requirements. The Agricultural Division of the State Defense Council and the fertilizer industry will unceasingly continue their efforts to present the true facts to the control officials and we hope that, through this means, a greater understanding of our problems will be had by the "Powers that Be".

It has been necessary for me to be in Washington several times since Pearl Harbor and in fairness to the many officials up there, I want to make a plea that you, as individuals and as groups, hold your correspondence or visits with them to a minimum. Present your problems to the proper agency in Florida and only after you are convinced that a solution is not possible with the Florida agency, take it up with Washington. Bear in mind that it takes an unusually long period of time to accomplish results in these trying times. It often takes two or three days for a letter to get from one Department to another in Washington. This delay, of course, is occasioned by the tremendous volume of work being done.

Time does not permit a statement covering many other effects of the war on the fertilizer industry, such as scarcity of bags, labor, transportation, etc., and I am sorry that it is impossible for me to give you any information as to the outlook for next season, but I believe that I can speak for the industry in pledging to you that we will secure a maximum quantity of all materials available and that the fertilizer produced from these materials will be distributed to the growers and farmers in Florida as equitably as possible. When the industry cannot supply you with exactly what you want at the time you want it, bear in mind that the materials necessary to produce that desired mixture may be at that time in a bomb falling in Tokyo and be thankful for the freedom that we now enjoy and that will be preserved at all costs.

RUST MITE CONTROL

(Continued from page 3)

under the glass without moving it. For this inspection the grower should provide himself with a good hand lens magnifying about ten times and not over fifteen, as the higher magnifications do not give one a large enough field for rapid work. Such a lens will cost anywhere from $1.50 to $6.00 or $7.00, according to the quality. The chief difference between the cheaper and more expensive lenses is that with the cheaper lenses the edges of the field will appear blurred and discolored, whereas the more expensive lenses have been corrected for this defect.

The remedy for rust mites is sulfur in some form. In Florida this is applied generally either in the form of a dust of finely ground sulfur or a spray of lime-sulfur and wettable sulfur. The dust is usually mixed with a small quantity of lime to make it go through the duster better. From five to ten pounds of lime are added to ninety or ninety-five pounds of sulfur dust. The lime does not kill rust mites but simply gives the dust a mechanical advantage of allowing it to go through the duster more readily. Whether one will find it of greater advantage to dust or to spray the grove will depend upon many circumstances, especially upon the size of the grove. A great advantage of dusting is the rapidity with which it can be applied. It can usually be applied in about one-tenth of the time it takes to spray the grove. In the case of a large grove, this is a great advantage. We have seen how rapidly rust mites multiply when weather conditions are favorable. If it takes a grower a week or ten days to cover his grove with his spray outfit, although he may begin at the proper time, severe injury may result before he gets around to the last part of the grove. For this reason owners of large groves usually depend upon dusting to control rust mites. Labor considered too, dusting is usually considerable cheaper than spraying.

On the other hand, spraying has distinct advantages, and there is undoubtedly at the present time a trend toward spraying for rust mites, particularly with those growers who have rather small holdings. The chief reason for this is that lime-sulfur spray has a very appreciable effect in controlling scale insects and whitefly, though the control is not as good as the application of an oil emulsion. Because of its inability to kill full grown scales and whiteflies, we do not recommend lime sulfur as a clean up spray in the place of an oil emulsion. The latter will be much more thorough. But where the infestation is not so heavy, an application of lime sulfur will often avoid the necessity of an oil spray which is always expensive.

Lime sulfur was formerly applied at about the rate of 1 gallon to 50 of water, but during the past several years the practice has become general of using less of the lime sulfur and fortifying it by adding to each 100 gallons of spray from five to ten pounds of wettable sulfur. This makes a safer spray and one fully as effective. If thoroughly applied to the underside of the leaves in reasonably warm weather this lime sulfur and wettable sulfur spray should also control spider mites, both the 6-spotted mite and the purple mite.

The presence of a good cover crop helps much in the control of rust mites as well as other insects. We will speak more fully of this later.

Buy repair parts for your grove equipment now — next month may be too late.

HOW THE FOOD FOR FREEDOM PROGRAM IS SHAPING UP

(Continued from page 5)

suplies of commercial vegetables, pork, beef, poultry and eggs, citrus fruits and other foods will more than fill the goals. Acreages of upland cotton, tobacco, corn and other field crops likely will be close to the goals or allotments.

Encouraging reports are being received from many counties. Some of them should be of interest here. These have been selected at random. Washington county farmers bought 60,000 pounds of seed peanuts to plant for oil production. In Sumter county 75 percent of the 4-H club boys and girls are growing a garden, in addition to their other 4-H projects.

The USDA War Board is sponsoring a "food for victory" contest open to all 4-H club members and future farmers.

Reports from other counties, almost without end, tell that the county's farmers will grow their biggest peanut crop on record, that more home gardens are being established, that meat, vegetables and fruits are being canned in large quantities, that farm families not already having chickens are establishing poultry flocks, that family milk cows and dairy calves are being obtained by farm families. Well, the list could be carried on until it would be boresome, but it isn't necessary.

Both white and colored farm families throughout the state are rallying to the food for freedom banner, even as they have responded to food production calls in the past. They are filling to overflowing the country's egg baskets, vegetable hampers, meat boxes and fruit baskets, and they will help materially in filling the oil tanks, naval stores barrels, cotton gins and grain bins.

The food for freedom program is bringing a better understanding of nutrition and diet requirements to Florida people, both rural and urban. The people are learning about what things are required for a good diet, for the best health of the family in peace time as well as war time. They are becoming increasingly aware of the fact that it is necessary to eat several different kinds of foods if they are to get their necessary daily supplies of vitamins, minerals and other health-giving substances. Out of all the havoc wrought by this war may come a better understanding of food requirements and a healthier people in this country in the future. If so, the food for freedom program will have served a most useful purpose, whether or not every goal is met.

It's encouraging to note reports from every county showing expanded home canning activities. Everybody knows that garden vegetables in Florida are less plentiful during summer than at other times, and prudent farm families are canning surplus products for feeding to their families later, when the fresh fruits and vegetables are not available. For a time it appeared that there might be a shortage of tin cans, but the government has given assurance that cans will be available for home canning. The government appreciates the value and necessity of home canned fruits and vegetables and has allotted steel and other metals for the manufacture of cans.

Community canning centers are operating in practically every county, and farm families who do not have individual canning equipment are taking advantage of the equipment at these centers.

A report received from Holmes county, out in western Florida, says that farm women of that county have bought 25,000 tin cans as a start for their canning program. Collier county has ordered 10,000 cans for preserving the surplus tomatoes at the end of the commercial shipping season.

Produce everything possible and waste nothing seems to be the order of the day. It is a fine order, evolved by a patriotic rural people who are doing their share to make themselves and others strong and help to win the war. They are doing a gigantic task well.

THE FLORIDA CITRUS SEASON TO DATE

(Continued from page 4)

many years.

The Federal Surplus Commodities Corporation has made effective two types of purchase programs for Florida citrus. One of these programs became effective on December 15 and has continued to date for the purchase of grapefruit and/or oranges for processing into pulp for shipment to Great Britain. The other was for the purchase of grapefruit for sectionizing. This program was effective from Dec. 22 to Jany. 17.

The Surplus Marketing Administration sponsored a purchase program to take from 100 to 200 cars of fresh grapefruit per week.

These three Federal purchase programs outlined above had taken 1,111,000 boxes of grapefruit and 118,000 boxes of oranges through April 18, 1942.

The Florida Citrus Commission has devoted most of its energies to its advertising program and to fostering essential research upon which to base more effective advertising work. Also, it has rendered inestimable service to Florida growers and shippers this season by taking the initiative in problems arising out of the defense and war situation.

One other important reason for a satisfactory citrus season is the efficient services that are being rendered by the rail and motor truck transportation systems.

In summary, Florida growers will perhaps receive a higher net income from citrus this season than from any recent crop. This higher income may not represent more purchasing power, for citrus production costs and living costs are advancing rapidly. For the entire United States, prices paid by farmers for commodities used in production and living increased 19 percent during the year ending with March, 1942. If living costs are reduced to bare necessities, however, more than normal savings may remain for paying off existing grove mortgages or for investment in defense savings bonds.

Telephones...
Connect the nerve centers of our nation, thus speeding wartime production.
READ THE SUN DIAL
The State's Smallest Newspaper
Listen to the Telephone Hour
Mondays, Over NBC
PENINSULAR TELEPHONE CO.

SOME PROBLEMS OF CONTROL OF SCALE INSECTS ON CITRUS

(Continued from page 7)

spray does not get underneath it and therefore does not come in contact with the eggs or young crawlers that have not emerged from under the armor of the mother scale. There is considerable work to be done in determining the most satisfactory period for applying the oil sprays for maximum seasonal control, but the results of five years of experimental work indicate a period between June 15 and July 15 as being as satisfactory as any. In two out of five years plots sprayed before June 15 became reinfested by October and in one year of five the plot sprayed about July 15 became so heavily infested by that date that unsatisfactory control resulted and a high percentage of the fruit was infested. Red scales sometime increase very rapidly from August to October so it is important to have the infestation at a lower level by August. To stress the importance of reducing to a minimum an example is sighted of the rapid increase of red scales between July and October. In 1940 at Vero Beach one plot was sprayed on June 13 with 1⅝ percent actual oil. Three weeks later a scale count was made from leaves collected from that plot (100 leaves collected per tree) and only an occasional live scale could be found. To be exact, there was an average of .01 living scale per leaf but by October 1 the infestation had increased to 10.9 living scales per leaf, an infestation heavy enough to warrant a fall spray. Infestations considered to be light ones in August, 1941, have increased to a marked degree throughout the winter and fall in the east coast sections and also in the central part of the state. It is realized that one month is a short period to cover a large acreage and if the infestation is watched closely the spray date may be extended into late July and early August if the fruit is not becoming infested or if the fruit is not to be picked until late in the fall. This latter consideration is important since the late summer oil sprays are likely to interfere with coloring. During years especially favorable for red scale development it may be necessary to apply a second oil spray but in the average year on thorough application of an oil emulsion at a concentration of 1½ to 1⅝ percent actual oil has resulted in fair to excellent control in the experimental plots as well as in commercial groves.

Considering actual control, the importance of timing the oil spray for purple scale control has not been so specific as with red scale. For all practical purposes the control, on an average has been satisfactory when the oil spray was applied any time between May 15 and August 1 for grapefruit and between June 15 and August 1 for oranges. The later date of June 15 for starting to spray oranges is suggested because injury sometimes develops on oranges following late May and early June oil sprays. Injury has also developed on oranges when the oil spray was applied within three weeks after a copper-wettable sulfur spray. Over a period of five years 73 timing plots have been sprayed. Thirty-eight of the plots were sprayed before July 15 and 35 plots were sprayed between July 15 and October 23. The final seasonal examinations were usually made in November or December and it was found that the scale population was somewhat higher on 66 percent of the plots sprayed before July 15 than on those sprayed after that date. However, in the majority of the plots the difference in degree of the infestations was not significant. Failure to obtain good commercial control occurred in four plots each of the early and late applications but in each case the trees were heavily infested at the time of application.

From the standpoint of a yearly practice the early summer sprays have been more satisfactory than sprays applied between July 15 and November or later. Some of the reasons for early summer spraying may be listed as efficient coverage, reduc-

TABLE 2

Development of Dead Wood Following Purple Scale Infestations where Control was Delayed.

Dates of Oil Spray	Series A		Series B		A	B
	Average No. of Living Scales Per Leaf				Amount and Size of Dead Wood April, 1942	
	At Time Of Spray	After Spray Nov. '41	At Time Of Spray	After Spray Nov. '41		
May 23	2.2	2.0	5.8	4.5		
June 16	4.9	1.2	18.0	5.9		
July 29	4.4	.6	19.3	5.3	Small Amount	
Sept. 9	21.1	1.6	39.0	2.4	Small Amount	¼" to ½" limbs
Sept. 22	8.8	1.0	30.8	1.6	¼" limbs	¼" to ¾" limbs
Oct. 8	23.7	.4	15.7	.8	¼" limbs	¾" to 1" limbs
Oct. 23	26.2	.7	13.1	2.0	¼" to ½" limbs	¼" to ½" limbs

tion of the infestation while it is at a low level, prevention of the infestation of new wood, leaves and fruit, less shock to the trees, and less effect of the oil spray in delaying the coloring of fruit in the fall.

Coverage. Coverage is one of the most important factors in scale control because it is necessary for the spray to come in contact with the scales to kill them. As near a complete coverage must be obtained as possible because purple scales infest all ages of wood, leaves and fruit. The most complete coverage can be obtained early in the summer before the weight of the fruit has bent the limbs and compacted the foliage. If the spraying is delayed until late summer or fall the clusters of fruit not only weigh down the limbs but prevent the turning of the foliage from the force of the spray thus resulting in incomplete coverage. More failures to control purple scales have resulted from inadequate coverage than any other one factor. It is especially important to spray limbs and twigs because much of the reinfestation of leaves comes from infested wood.

Spray before infestation becomes heavy. One reason for early summer spraying is to reduce the population while it is at a minimum. Even though a high mortality may be obtained with oil sprays, there are more living scales remaining where the infestation is heavy at the time the spray is applied than when lighter infestations are treated. Last October in one particular experiment the same percentage of reduction of infestation was obtained in three different plots of varying degrees of infestation. Trees in two of the plots had about 90 percent more scales on the leaves than leaves from the other plot. Seven weeks after the spray the infestation had been reduced approximately 97 percent in each plot. In March of this year another inspection was made and there were 400 percent more scales in the two plots that had a heavy infestation at the time of spraying than the one with the lighter infestation. Such differences in reinfestations have not always occurred after spraying but generally the degree of infestation at the time of spraying has been reflected on the infestation the following year.

Prevention of the infestation of wood, leaves and fruit. The importance of preventing the wood from becoming infested should be realized by everyone. A heavy infestation of scales on the wood during the late summer and early fall may cause heavy fruit and leaf drop, dead wood and weaken the tree to such an extent that the next crop may be affected. Results of such experiments were presented before this society last year (2). Observations in commercial groves and experiments conducted in 1941 substantiates that work. The infestation on the wood was not so heavy in 1941 nor was there an extended dry period as in the fall of 1940 so that the amount of dead wood was less last year than in 1940 but trees that were sprayed between May 23 and July 30 had less dead wood this spring and are in a more vigorous growing condition now than trees in the same block that were sprayed between September 8 and October 24. On an average the scale population has been a little higher on trees sprayed early in the summer than on those sprayed in the fall but in the majority of cases it was no higher than it was the previous spring and there was a minimum amount of dead wood on those whereas on the fall-sprayed trees the dead wood was very noticeable (Table 2). The fruit should be kept free of scales to prevent dropping and also to prevent "green spots" on fruit that is colored in the coloring room. Purple scales on fruit affect in some way the immediate area around them in such a way that the gas does not affect that area and it remains green after the remainder of the fruit has colored. Green spots caused by purple scales have been an important grade-lowering factor of fruit shipped early in the season and the sooner the oil spray is applied in the summer the less chance there is for the fruit to become infested. It is much more difficult to obtain a thorough coverage of the fruit with a spray after it reaches three or more inches in diameter than when it is smaller.

Tree shock. Oil sprays shock the trees to a certain extent but the shock is evidently less when the sprays are applied during early summer than during the late summer and fall months. Aside from the drain on the tree caused by scale insects, the maturing crop of fruit devitalizes the trees to a certain extent which makes them more susceptible to injury from an oil spray if they are also heavily infested with scales. More dead wood developed on trees sprayed in the months of September

(Continued on page 18)

Keep Your Soil in the Pink of Condition for the Peak of Profits!

With an impending fertilizer material shortage, you've got to make up for missing elements by turning to nature for help. Legumes can help supply you with needed nitrogen. But nature can't help you—unless you keep your soil in the pink of condition. Liberal use of **D/P DOLOMITE** assures a soil at proper pH, and gives you essential calcium and magnesium carbonates. Keep your profits up with **D/P DOLOMITE.**

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The LYONIZER

Department

COMPILED BY THE LYONS FERTILIZER CO.

Reports of Lyons Field Men . . .

SOUTHWEST FLORIDA
F. W. (Felton) Scott

The spring tomato shipments are well under way with heavy movements being made from Ruskin, Palmetto and Wauchula. Prices have been from fair to good up to this time. The cucumber yield has been very good and early prices were good but when heavy movement started prices declined to a very disappointing level. Citrus groves throughout the territory are still looking very good and recent showers have been very beneficial in setting the new fruit crop. We are urging all growers to establish a cover crop on their soil this summer.

HILLSBOROUGH AND PINELLAS COUNTIES
C. S. (Charlie) Little

We have been having quite a lot of rain during the past two weeks in this section and it now appears that we are going to have a nice crop of fruit set on practically all varieties. Early oranges and marsh seedless grapefruit are setting a lighter crop of fruit than other varieties. There are very few valencias left in this section to be moved to the market, and most growers have been somewhat disappointed in the number of boxes their valencia crop picked out. We have had heavy infestations of six spotted mite and red spider throughout the territory and growers have been busy trying to get these insects under control. In many cases applications of oil have been made.

WEST CENTRAL FLORIDA
E. A. (Mac) McCartney

Growers are feeling good throughout the territory. There has been some rain — enough to pick up the production on vegetables — but we can stand more on citrus groves. These rains were very badly needed. Citrus growers especially appreciated the rains as fruit had been dropping badly and this moisture will be very helpful in setting a crop of fruit for coming season. It now appears that we will have a light crop of early and mid-season fruit in this section but valencias and grapefruit are setting plenty of fruit for a heavy crop. Valencias are moving from this section at good prices but the season will be over in several weeks. Vegetable growers in this section have had difficulty in producing their crops but the yield is fair at this time and all varieties of vegetables are bringing fair prices on the market.

NORTH CENTRAL FLORIDA
V. E. Bourland

Citrus groves throughout the territory are looking good with the exception of those properties that have been infested with six spotted mite and red spider. Growers have been busy getting these pests under control. Valencias are still moving to market from this territory but a number of packing houses have closed and it appears that our fruit shipments will be through shortly after June 1st. Watermelons are beginning to move from Lake county. The acreage of melons is not as large this year as usual but there are a number of very fine fields in the territory and some very fine melons will be moved to the market. The vegetable crops in the Winter Garden section did very well this spring and in most cases fair prices were received. However, the season is now just about over, and growers are making ready to plant cover crops to all of their lands.

POLK COUNTY
J. M. (Jim) Sample

The rains during the middle of May were extremely beneficial to citrus groves in all sections of the county. Many growers had started to irrigate their properties in an effort to set this crop of fruit. However, since we have had these rains the fruit is beginning to grow and on most varieties we are getting a good set of fruit. Growers have gone forward with their summer application of fertilizer and this will be completed by the 15th of June. Spray tanks have been busy, and still are for that matter, in applying proper disease and insect control measures. From the interest being shown by growers in this section it is safe to predict that we are going to have a nice crop of real quality fruit to place on the market this fall.

Horticultural Hints

The spirit of cooperation shown by both vegetable and citrus growers of Florida in the conservation of fertilizer materials during the past few months to allow every possible pound of nitrogenous or other fertilizer materials to be diverted to war production is splendid evidence on the part of every grower that they are interested in doing their bit to bring this war to its earliest conclusion.

We are all having difficulty in obtaining just the exact materials and in the poundage that we would normally like to use. However, where we have our groves in excellent condition it is possible that we can maintain production of quality fruit through a program of conservation over some period of time. We all must face the fact that this war has to be won and that we must do our part whether it be on the battle field or at home.

We particularly want to urge all citrus and vegetable growers to make plans at this time to establish a cover crop this summer. After you have finished with your summer application of fertilizer you should immediately see that you have seed for growth of cover crop. If your crop last year did not thoroughly reseed for this crop then obtain new seed and plant in your grove. Just as soon as vegetable growers have harvested their crops they should plant cover crop. We further suggest that if it should be extremely dry before the cover crop is established that you irrigate for protection of the cover crop whether the grove shows signs of the drought or not. The Lyons Field Man will be glad to advise with you regarding the variety of cover crop that should be planted on your individual property.

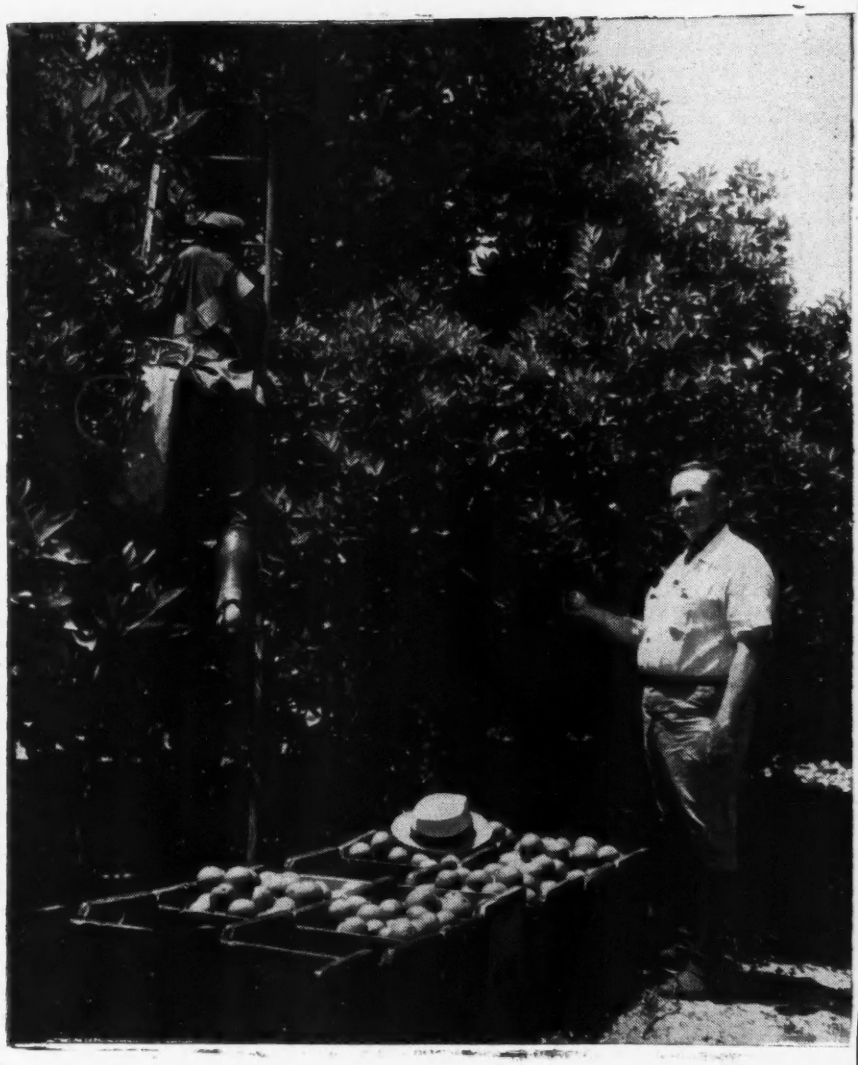
Keep a close check on diseases and insects and when necessary to spray do not hesitate to make the necessary application of spray materials. Trees that are maintained in a vigorous healthy condition will produce more fruit, better fruit and more consistently, year after year than trees that have been subjected to diseases and the damage caused by insects. Here again you will find that the Lyons Field Man can be of service to you.

ADVERTISEMENT—LYONS FERTILIZER COMPANY

"Guy" Maxcy Gets Excellent Results From Lyons Fertilizers Over 11 Year Period

Guignard (Guy) Maxcy of Sebring owns and operates several hundred acres of grove property in Highlands County. He has made an outstanding success with his various properties and his groves are the show spots of the section. Mr. Maxcy has been using our Fertilizers for the past eleven years and states that he has always obtained excellent results from the use of LYONS FERTILIZERS.

Mr. Maxcy is shown in one of the groves under his supervision on this page. This grove consists of 25 acres and was taken over by Mr. Maxcy 11 years ago. At that time the property had been bought by a customer for $25,000. This grove has made a profit of three times the cost of the grove in this period of time, and has been fertilized exclusively with LYONS FERTILIZERS. This season the gross income from the grove was $11,660.



Lyons Fertilizers Have Been Doing Standout Jobs For Florida Growers For Many Years....Producing MAXIMUM CROPS OF HIGHEST QUALITY

SOME PROBLEMS OF CONTROL OF SCALE INSECTS ON CITRUS

(Continued from page 15)

and October that had a crop of fruit and were heavily infested with scales than developed on trees with no crop. By the same token, trees with a crop but a light infestation of scales did not develop nearly as much dead wood as where both devitalizing factors of crop and heavy scale infestation were present. In one block of trees a pronounced amount of dead wood developed following a September application of oil on trees that were heavily loaded with fruit and also had a fairly heavy infestation of purple scales, but no noticeable amount of dead wood developed in two rows that were sprayed at the same time the rest of the block was sprayed. Those two rows had as large a crop as the other trees but the scale infestation was much lighter because it had been reduced with an oil spray in June. During the past six years the amount of dead wood has been of no consequence in several hundred oil-sprayed plots where the spray was applied during the summer on trees with light to medium infestations of scales. In one block of 64 trees, 16 of those trees received an oil spray each year for seven years and at the present time they are in better condition than the 56 trees which received only three oil sprays in that period. The 16 trees are in a better general condition because the scale population has been kept at a minimum whereas the 56 trees have had three rather heavy infestations of scales during the past five years which have been more detrimental to the trees than an annual oil spray.

The period between May 15 and July 15 for oil sprays has been suggested because the least amount of injury has occurred on trees sprayed during those months but if scale infestations develop in the fall months it is advisable to spray rather than wait until summer. More dead wood has developed on trees where the infestation was not checked in the fall than on adjacent trees sprayed in October and November, respectively.

Coloring fruit following oil sprays. The early summer oil spray is advantageous from the standpoint of coloring fruit early in the season. Results from experiments conducted to date indicate that oil sprays retard the artificial coloring of grapefruit more than Pineapple oranges but in either case there has been less trouble coloring fruit picked from trees sprayed before July 15 than from trees sprayed after that date. The seasonal condition is also a factor influencing the coloring of fruit and if conditions are favorable for natural coloring the influence of oil sprays is not so marked. As pointed out by Stearns and Young (1) the fall seasonal conditions influence the natural break in color which in turn is reflected in the period required for artificial coloring. In 1940 the mean temperature was lower during late October and early November than during the same period in 1941 and fruit from oil-sprayed plots colored in a shorter period of time in 1940 than in 1941. In 1940 Marsh seedless grapefruit picked on October 18 from three plots sprayed between May 16 and July 15 and held in the coloring room for 54 hours had 82 percent of the fruit colored compared to 65 percent of fruit colored from three plots sprayed between August 1 and September 30. Ninety-one percent of the fruit was colored from the unsprayed check. In the same grove in 1941, two plots were sprayed on June 15 and July 15, respectively, and two other plots were sprayed on July 31 and August 15, respectively. The fruit was picked on October 27 or nine days later than in 1940. After a period of 40 hours in the coloring room an average of 52 percent of the fruit was colored from plots sprayed June 15 and July 15 as compared to 15 percent colored from the two plots sprayed on July 31 and August 15. After 62 hours in the coloring room 95 percent of the fruit was colored from the two earlier sprayed plots and 54 percent colored from the two plots sprayed later in the summer. About the same difference in rate of coloring between early summer and late summer spraying was evident in a seedy grapefruit block in another grove where the respective plots were sprayed on the same days as the plots in the experiment discussed above. The fruit was picked on November 20 and was held in the coloring room 27 hours. At the end of the 27-hour period 92 percent of the fruit had colored from the early-summer sprayed plots and 53 percent was colored from the plots sprayed in late summer.

An oil spray has not retarded the artificial coloring of Pineapple oranges as much as it has grapefruit but the general trend is the same. In 1939 and in 1940 there was not so much difference in the time required to color oranges picked from the early-summer sprayed plots compared to the time to color fruit from the late-summer and early-fall sprayed plots but in 1941 there was a significant difference. In 1941 a series of duplicate plots were sprayed at various times between May 5 and October 23. Four plots were sprayed

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between May 5 and July 10, inclusive, and five were sprayed between July 31 and October 23, inclusive. The fruit was picked on November 4 and held in the coloring room 43 hours. At the end of the 43-hour period an average of 77 percent of the fruit was colored from plots sprayed prior to July 11 and an average of 54 percent was colored from the plots sprayed between July 31 and October 23. In the early-summer sprayed plots the variations in percentage of fruit that colored ranged from 67 percent to 85 percent and in the late-summer sprayed plots the range was from 48 percent to 63 percent colored. The lot of fruit with only 48 percent colored was from plots sprayed on September 31 compared to 54 percent colored fruit from plots sprayed on October 23. After the fruit had been in the coloring room 65 hours 99 percent was colored from all plots. On November 18 another lot of fruit was picked from the same plots and held in the coloring room 40 hours. At the end of that period 99 percent of the fruit had colored from plots sprayed by July 10 and an average of 91 percent had colored from plots sprayed later in the summer.

Sometimes two oil sprays are necessary for scale control and where such has been the case the rate of coloring has varied with the dates of applications. Where two applications were made on Pineapple orange trees on May 5 and September 9 the fruit from that plot colored as soon as the fruit from an adjacent plot which was sprayed for the first time on September 9. In another Pineapple block where the spray dates were somewhat later the fruit was slower in coloring. Plot 3 was sprayed June 9 and October 9 and Plot 4 was sprayed for the first time on October 9. Some fruit was picked on November 10 and at the end of a 40-hour period in the coloring room, 80 percent of the fruit was colored from Plot 3 and 94 percent was colored from Plot 4. At the end of a 63-hour period, however, 99 percent was colored from both plots.

Timing of the oil spray is not the only factor which may influence coloring. Oils from the same stock but emulsified with different materials have retarded coloring in varying degrees; in fact, more so than some oils with varying specifications. In one instance where the respective plots had been sprayed with three different emulsions made from the same oil stock the rate of coloring varied considerably. At the end of a 39-hour period in the coloring room 59 percent of one lot had colored, 79 percent of another lot and 85 percent of another. In three out of four different oils tested there was a variation in the rate of coloring of fruit where the same oil stock was emulsified with different materials.

Oils. Only a few remarks concerning different types of oils and oil emulsions will be made. Since scale infestations have been somewhat more difficult to control there has been a feeling among some growers that the lighter oils of 70 to 85 viscosity now in common use in the state are not as effective as the heavier oils of 100 to 125 viscosity. Very little work has been done at the Citrus Station on the testing of different grades of oil for scale control. The few tests that have been conducted show no evidence of any significant difference in control where an oil of 70 viscosity was compared with one of 100 viscosity and another of 126 viscosity, the same emulsifier being used with all three types of oil. There has been more difference in kill where the same type oil was used with various emulsifying agents than where different oils were used with the same emulsifier. It would be wise to investigate carefully before changing from the light to the heavier oil because it is necessary to over-spray certain parts of the tree in order to obtain a thorough coverage and the lighter oils may cause less injury than the heavier ones.

The concentration of oil in the dilute spray is an important item. In the experimental plots applied at 1¼ percent to 1⅓ percent actual oil in the dilute spray have resulted in satisfactory control on light to medium infestations of purple scales but on heavy infestations 1½ percent actual oil has been much more satisfactory. Some growers are now using 1½ percent with all applications with more success than at concentrations of 1⅓ percent and if that is the case it is better to use the higher concentration. For red scale control concentrations of 1½ to 1⅝ percent actual oil have always been more satisfactory than weaker concentrations.

Conclusions

Vigorous tree condition has been conducive to the development of purple and Florida red scale infestations and where groves have been maintained in such a condition throughout each year an annual oil application has been necessary in order to prevent the build-up of heavy infestations. The results of numerous experiments indicate that as a general practice the most satisfactory results have been obtained when the sprays were applied before August 1. Advantages of early summer spraying compared to late summer and fall sprays have been less rapid reinfestation when the infestation was controlled while it was at a low level, prevention of the infestation of young foliage, wood and leaves, and less shock to the trees which in turn has resulted in the minimum loss of leaves and fruit and the minimum development of dead wood. The effect of an oil spray in retarding the coloring of early varieties was also minimized. In general, the practice of applying an anual oil spray in June or July has been more economical than waiting until fall to see whether an infestation develops or to depend upon natural agencies for control.

(1) Stearns, Charles R., and Geo. T. Young. The relation of climatic conditions to development of color in citrus. Proceedings Fla. State Hort. Soc. 1942 (in press).

(2) Thompson, W. L. The present status of scale insects infesting citrus. Citrus Industry 22(6):5.

SPECIALIST WARNS HOME-MAKERS NOT TO USE SACCHARIN

A warning to Florida home-makers against the use of saccharin as a substitute for sugar in canning and preserving fruits has been issued by Isabelle S. Thursby, food specialist with the State Home Demonstration Department.

Saccharin, a white crystalline derivative of coal tar, is 300 times as sweet as sugar, but it is not a carbohydrate and possesses no food value, and should not be used except by doctor's prescription, Miss Thursby explained recently.

The home demonstration worker also pointed out that most state food laws prohibit use of saccharin in food products because it is considered unsafe for general use.

Miss Thursby listed sugar, salt, and alum as the three commonly used food hardeners, but she urged home-makers not to use alum because it is unnecessary if pickles are made by modern methods and because it is an adulterant. Sugar and salt are not considered adulterants in canning fruits and vegetables.

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